

MEDICAID EXPANSION AND EFFECTS ON  
RACIAL DISPARITIES IN INFANT MORTALITY

by  
Julian Garcia

A capstone submitted to Johns Hopkins University in conformity with the requirements  
for the degree of Master of Science in Data Analytics and Policy

Baltimore, Maryland  
August, 2021

© 2021 Julian Garcia  
All Rights Reserved

## **Abstract**

The Medicaid expansion has impacted several areas within the United States healthcare system including infant mortality rate. This research revisits racial disparities in infant mortality rate that were previously analyzed for the limited years past after 2014. By addressing newer years, this study assesses the impact of the Affordable Care Act's 2014 expansion of Medicaid on racial disparities in infant mortality. To analyze changes in racial disparities among infant mortality rate, difference-in-difference and multivariate regression models were used to study the impact of the Medicaid expansion on infant mortality rate over time and to evaluate the impact of the primary predictors in studies of infant mortality. The results of this research demonstrates that the 2014 Medicaid expansion decreased infant mortality rate, however, the expansion also continued existing racial disparities.

## Table of Contents

Introduction.....	1
Literature Review and Theoretical Framework.....	2
Data and Methods.....	7
Results.....	10
Conclusion.....	12
References.....	15
Curriculum Vita.....	18

## **Introduction**

Health care policy in the United States is not a uniform system. As each state passes certain bills, health determinants are affected as a result. These state decisions fall in line with either private, employer or government funded health insurance. The Affordable Care Act brought about massive changes to the U.S. health system. Such changes included an expansion to Medicaid. This expansion would begin in 2014 and would be up to individual states to opt into the expansion. Medicaid provides millions of Americans with health insurance. As such, the state of the Medicaid program is a determinant to the health outcomes that the program produces. With the changes made to the program in the Affordable Care Act, several health outcomes came to change after the enactment in 2014. A crucial health outcome for societies are their infant mortality rates. These rates become a basis upon which the continuation of societies, cultures and ethnicities. Infant mortality can be linked to population stabilization and economic power. With a general objective of consistently lowering the U.S. infant mortality rate, this statistic can be very influential in determining policy. While the Medicaid expansion is an example of changed health care policy, unintended disparities can form as a result.

Health disparities have been an issue for U.S. health care policy for many years. In some instances, a policy intended to solely benefit an underserved population can negatively impact another population. Within the United States racial disparities have spread throughout society and the economy with the health care system being included. This study examines the racial disparities in infant mortality rate that is a result of the implementation of the Medicaid expansion. Building upon established literature concerning the influence of the Medicaid expansion, this study adds to the little researched area of infant mortality rate. Current literature

emphasizes on many areas of health outcomes in which racial disparities is well documented. The research conducted will provide an updated analysis of time on infant mortality rate.

This study will use a combination of the difference-in-difference and multivariate regression models to examine the influence of the Medicaid expansion of infant mortality rate. The difference-in-difference model will analyze the aggregated infant mortality rates of expansion and non-expansion states over time since the initial implementation in 2014. The multivariate regression follows with an analysis of the primary predictors that can influence infant mortality rate. These analyses will provide a glimpse at the Medicaid expansion and its impact upon racial disparities in infant mortality rates in the United States.

## **Literature Review and Theoretical Framework**

The expansion to Medicaid came as a component to the Affordable Care Act (ACA) in 2010. This component came as a result of a need for increasing access to health care for low-income individuals and families. In 2010, there was an estimated 49.9 million uninsured individuals or 16.3% of the population of the United States.<sup>1</sup> This number of uninsured Americans drew attention to the long-standing issue of lack of access to health care. The ACA would implement a number of components at staggered points in time with the major components enacted in 2014. The expansion of Medicaid was one such program that enacted in 2014. The primary element of the Medicaid expansion sought to provide coverage to individuals

---

<sup>1</sup> “Overview of the Uninsured in the United States: A Summary of the 2011 Current Population Survey.” ASPE, February 21, 2017. <https://aspe.hhs.gov/basic-report/overview-uninsured-united-states-summary-2011-current-population-survey>.

and families with income at or less than 138% of the Federal Poverty Line (FPL). By implementing this legislation, the goal was to eliminate the “Coverage Gap”, the section of individuals that fall below the eligibility for marketplace subsidies (100% of FPL) but making more than allowed previously for the Medicaid program (41% of FPL).

The Coverage Gap has remained an issue due to many states not implementing the Medicaid expansion after a legal proceeding by the Supreme Court deemed the expansion optional for states to implement. Due to the optional status of the program’s expansion, many states (majority Southern) have opted out. This legal decision created a situation of racial inequality in health care coverage.<sup>2</sup> This is due to 80% of Coverage Gap individuals living in the South and a majority of the African American population residing in the region.<sup>3</sup> Adding to that conclusion, racial/ethnic minorities are more likely to live in low-income families causing a much larger representation within the Coverage Gap than White/Non-Hispanic.<sup>4</sup> The legal development of the optionality of Medicaid expansion has continued the Coverage Gap years after the start of the enactment. When searching the elements influenced by the Medicaid expansion, inequality became a prominent issue arising from the legislation. While the expansion was intended resolve the economic inequality faced by individuals and families, the opting out of the Medicaid expansion became a primary contributor to a slower decline in income related inequality in health insurance coverage than states that implemented the program.<sup>5</sup>

---

<sup>2</sup> Andrews, Christina. 2014. “Unintended Consequences: Medicaid Expansion and Racial Inequality in Access to Health Insurance.” *Health & Social Work* 39 (3): 131–32. doi:10.1093/hsw/hlu024.

<sup>3</sup> Andrews, “Unintended Consequences: Medicaid Expansion and Racial Inequality in Access to Health Insurance.”, 132.

<sup>4</sup> Garfield, Rachel and Damico, Anthony. 2017. “The Coverage Gap: Uninsured Poor Adults in States that Do Not Expand Medicaid.” Kaiser Family Foundation: 2.

<sup>5</sup> Renna, Francesco, Kostea, Vasilios D. and Dinkar, Kuchibhotla. 2020. “Inequality in health insurance coverage before and after the Affordable Care Act.” *Health Economics* 30 (2):399. doi:10.1002/hec.4195.

The Medicaid expansion was legislation that was meant to resolve economic inequality in the health care sphere. While there still remained an issue of economic inequality, the issue of racial/ethnic inequality became a presence worth noting. Among recipients of the Medicaid expansion, racial/ethnic minorities did not have a prominent focus during the creation and implementation under this component of the ACA. This provided standing that the Medicaid expansion had done little to prevent racial/ethnic disparities during the implementation of the program.<sup>6</sup> This finding came from regression models of several racial/ethnic minorities to show their gaps in health insurance coverage. The regression models were conducted to evaluate insurance gaps between Hispanic/White, Black/White and Asian/White minorities. Their results show that while there is an increase in racial/ethnic health insurance coverage, the increase was not substantially different between states that did and did not enact the Medicaid expansion.<sup>7</sup> This minimal increase difference in racial/ethnic health insurance coverage between states that did and did not opt in to the Medicaid expansion is due to the expansion not having an independent effect.<sup>8</sup> While minorities groups have seen a lower beneficial value of the expansion, however, all minority groups may not see the same rate of benefits. A study found that low-income, nonelderly adult Hispanic population saw fewer benefits as a result from the expansion when compared to other racial/ethnic minority groups.<sup>9</sup> The study mainly focused on effects on Hispanic disparities in the program but looked towards other racial/ethnic groups for comparison. The research also found that Non-Hispanic Whites were subject to far greater

---

<sup>6</sup> Flores, René D., and Vargas, Robert. 2017. "Medicaid Expansion and Ethnoracial Disparities in Health Insurance Coverage." *Journal of Ethnic & Migration Studies* 43 (12): 2068. doi:10.1080/1369183X.2017.1323451.

<sup>7</sup> Flores, René D., and Vargas, Robert. "Medicaid Expansion and Ethnoracial Disparities in Health Insurance Coverage." 2066.

<sup>8</sup> Flores, René D., and Vargas, Robert. "Medicaid Expansion and Ethnoracial Disparities in Health Insurance Coverage." 2066.

<sup>9</sup> Yue, Dahai, Petra W. Rasmussen, and Ninez A. Ponce. 2018. "Racial/Ethnic Differential Effects of Medicaid Expansion on Health Care Access." *Health Services Research* 53 (5): 3650. doi:10.1111/1475-6773.12834.

benefits as a result of the expansion.<sup>10</sup> This would relieve a majority of the low-income White population and leaving other racial/ethnic groups as the majority of individuals continuing to face health care coverage inequality.<sup>11</sup> Within these disparities are issues at more specific levels than a generalized view of racial/ethnic inequality.

Cancer has long been a disease that has affected individuals in a multitude of ways. When receiving care from Medicaid, the expansion shown a disparity between Black and White individuals' mortality rate from cancer. This can be explained by a study on Black/ White breast cancer mortality disparities. An analysis on the Medicaid expansion and the Black/White disparity on breast cancer mortality by using regression models on states that did and did not expand Medicaid was conducted. The research found that there were two primary reasons for the disparity in breast cancer mortality: a lower proportion of African American women were enrolled through the Medicaid expansion and the quality of care available to African American women were lower than the quality available to White women.<sup>12</sup> These conclusions highlight the fact that while an increase access to health care coverage is beneficial, the expansion did not impact the quality of care that such recipients were able to receive.

As just described, the Medicaid program is not unrelated with mortality rates. A prominent statistic that is of due concern is infant mortality. Current literature provides two studies on the issue of the Medicaid expansion on infant mortality. The first study noted that both expansion and non-expansion states saw a decrease in infant mortality rates during the observed

---

<sup>10</sup> Yue, Dahai, Petra W. Rasmussen, and Ninez A. Ponce. "Racial/Ethnic Differential Effects of Medicaid Expansion on Health Care Access." 3651.

<sup>11</sup> Yue, Dahai, Petra W. Rasmussen, and Ninez A. Ponce. "Racial/Ethnic Differential Effects of Medicaid Expansion on Health Care Access." 3651.

<sup>12</sup> Semprini, Jason and Olopade, Olufunmilayo. 2020. "Evaluating the Effect of Medicaid Expansion on Black/White Breast Cancer Mortality Disparities: A Difference-in-Difference Analysis." *American Society of Clinical Oncology* 6:1180. doi:10.1200/GO.20.00068.



years (2010-2016). The result shown a 50% higher decrease in infant mortality in expansion states as opposed to non-expansion.<sup>13</sup> Another finding was that there were regional differences in infant mortality with Southern states having higher rates among the other regions.<sup>14</sup> The second study was a continuation of the first study with an addition of 2017 to the observed years. This second study observed Hispanic infant mortality specifically among other racial/ethnic groups. The mean Hispanic infant mortality rate was found to have been reduced by 6% in expansion states after the Medicaid expansion.<sup>15</sup> The research noted that it could not attribute to the decreases in infant mortality rate to any specific feature of the Medicaid expansion.<sup>16</sup>

The benefits of the Medicaid expansion have largely been attributed to the increase in enrolled recipients in the program. When considering the benefits beyond this initial point, many have found mixed results when it came to disparities in different aspects of health impacts. This conclusion works in tandem with what was previously acknowledged; quality of care has been largely unaffected by the Medicaid expansion leaving many new recipients with lackluster care. On the other hand, one article of research proposed that the Medicaid expansion was solely responsible for a 43% decrease in coverage disparity by income.<sup>17</sup> This decrease would be concluded from analyzing the first three years (2014-16) of the expansion and its data. This may

---

<sup>13</sup> Bhatt, Chintan B, and Consuelo M Beck-Sagué. 2018. "Medicaid Expansion and Infant Mortality in the United States." *American journal of public health* 108(4): 566. doi:10.2105/AJPH.2017.304218

<sup>14</sup> Bhatt, Chintan B, and Consuelo M Beck-Sagué. "Medicaid Expansion and Infant Mortality in the United States." *American journal of public health*. 566.

<sup>15</sup> Wiggins, Alexandra, Ibraheem M. Karaye, and Jennifer A. Horney. 2020. "Medicaid Expansion and Infant Mortality, Revisited: A Difference-in-Differences Analysis." *Health Services Research* 55 (3): 395. doi:10.1111/1475-6773.13286.

<sup>16</sup> Wiggins, Alexandra, Ibraheem M. Karaye, and Jennifer A. Horney. "Medicaid Expansion and Infant Mortality, Revisited: A Difference-in-Differences Analysis." 396.

<sup>17</sup> Courtemanche, Charles, James Marton, Benjamin Ukert, Aaron Yelowitz, Daniela Zapata, and Ishtiaque Fazlul. 2019. "The Three-Year Impact of the Affordable Care Act on Disparities in Insurance Coverage." *Health Services Research* 54 Suppl 1 (February): 314. doi:10.1111/1475-6773.13077.

show that the early years after enactment of the legislation brought a drastic impact to health care disparities.

Narratives were illustrated that the Medicaid expansion did little in regards of reducing any existing disparities and allowed pre-existing disparities to persist. Counters to this narrative propose that the expansion has significantly reduced disparities across several crucial areas. Racial/ethnic infant mortality rate has been a lesser researched disparity from the Medicaid expansion. This research is looking to build on previous analysis on infant mortality rate to study racial/ethnic disparities from the expansion until 2019.

## Data and Methods

This study seeks to research infant mortality disparity among racial groups after the Medicaid expansion. This research used a difference-in-difference model to analyze the relationship between infant mortality rate (IMR) and the Medicaid expansion over the years since the national implementation in 2014. The DID model displays an analysis of overall, White Non-Hispanic and Black Non-Hispanic categories and their relationship with IMR.

**TABLE 1** Infant mortality rate (IMR) in United States since Medicaid expansion

Category	Expansion State IMR (Outset Year)	Expansion State IMR (2019)	Non- Expansion State IMR (Outset Year)	Non- Expansion State IMR (2019)	DID
United States	5.671	5.655	6.683	6.707	0.04

White Non-Hispanic	4.900	4.610	5.395	5.292	0.187
Black Non-Hispanic	11.000	11.018	11.541	12.649	-1.09

Abbreviations: DID, difference-in-differences; IMR, infant mortality rate.  
Data source: CDC NCHS, National Vital Statistics System.

DID is particularly astute for category comparison over a period of time. Table 1 compares IMR categories of White Non-Hispanic and Black Non-Hispanic with the United States as a control value for comparison. In all categories, expansion states listed lower IMR than non-expansion states in both outset year and 2019. The DID calculation for the United States provided 0.04 nationally. White Non-Hispanic and Black Non-Hispanic provided DID measures of 0.187 and -1.09 respectively. This data denotes that White Non-Hispanic saw a 0.187 percent difference IMR for expansion states compared to non-expansion while Black Non-Hispanic faced a -1.09 difference. This shows a widening of the IMR gap for Black Non-Hispanic as compared to White Non-Hispanic when comparing state expansion. As this model shows, there is a disparity in Black-White IMR with Black IMR increasing in both expansion and non-expansion states. The results provide a minimal change to IMR that can be partially explained through table 2. Table 2 helps to visualize the gradual implementation of the Medicaid expansion over time, causing this analysis on IMR to be conducted at different stages of post-implementation. As of 2021, thirteen states have yet to implement the expansion to the Medicaid program.

**TABLE 2** Year each state implemented Medicaid expansion

State	Enactment Year
2014	AZ,AR,CA,CO,CT,DE, HI,IL,IA,KY,MD,MA,MI, MN,NV,NH,NJ,NM,NY, ND,OH,OR,RI,VT,WA,WV

2015	AK,IN,PA
2016	LA,MT
2019	ME,VA
2020	ID,NE,UT
2021	OK
Medicaid not implemented	AL,FL,GA,KS,MS,MO*, NC,SC,SD,TN,TX,WI, WY

\*Missouri adopted Medicaid expansion in 2020 but has not been implemented yet.

The DID model was able to provide a look at the comparison of expansion and non-expansion states over time for the designated groups. This glance at the IMR is helpful but it does not control for other variables. To address this, a multivariate regression model was used to account for an accurate impact on IMR.

**Table 3** Multivariate regression model on IMR

	Model 1	Model 2	Model 3
(Intercept)	5.31 *** (0.21)	5.85 *** (0.27)	2.85 * (1.08)
TPASS	0.05 (0.08)	-0.00 (0.08)	0.05 (0.08)
MEDINC		-0.94 ** (0.34)	-0.15 (0.42)
POVRATE			21.64 ** (7.60)
N	37	37	37
R <sup>2</sup>	0.01	0.19	0.35

\*\*\* p < 0.001; \*\* p < 0.01; \* p < 0.05.

Data source: CDC NCHS, American Community Survey (ACS).

The results of table 3 are displayed through three models. The intercept used in the three models is IMR. Table 3 provides controlling variables to analyze the effect of external variables on IMR. The regression analyzed the effect of implementation timing (TPASS) of the Medicaid expansion. The coefficient of TPASS was shown to be near zero for all models listing 0.05, -0.00 and 0.05 consecutively. The effect of median household income (MEDINC) on IMR was

calculated at -0.94 initially with -0.15 for the last model. The poverty rate (POVRATE) displayed a large connection with IMR at 21.64 under model 3. The resulting  $R^2$  from the multivariate models were .01, 0.19 and 0.35 respectively. This data can be considered extremely weak to describe the conditional relation with other variables, especially model 1 with only analyzing the impact of timing on IMR.

## **Results**

The data calculated is the result of a two-part analysis on IMR. The first step of analysis was with the use of difference-in-difference modeling to analyze the impact time when comparing expansion and non-expansion states. The second stage of analysis was by multivariate regression. This regression was used to control for the influence of independent variables on the impact of time (TPASS) on IMR. The DID model provides measures of 0.04, 0.187 and -1.09 for the United States, White Non-Hispanic and Black Non-Hispanic respectively. The time periods used for comparison are the outset year (2014) and 2019. The year 2014 was chosen as the beginning year because since the expansion was due to be implemented during 2014 any changes in IMR would begin the year after. This leaves 2014 as a starting point for any possible influences from the expansion. The categories Non-Hispanic and Black Non-Hispanic are compared with the United States as a control variable. The resulting DID values provide a premise for understanding the IMR disparity. The positive DID values correspond with a decrease in IMR while a negative DID value corresponds with an increase in IMR. Both White Non-Hispanic and the United States experienced a decrease in overall IMR. Black Non-Hispanic was the only category to see an increase in IMR. For both White Non-Hispanic and the United

States, the values provided depict a noticeably high positive value for the averaged expansion state values when juxtaposed with a lower positive value from non-expansion states.<sup>18</sup>

The second stage in analysis is the multivariate model. Table 3 dealt with controlling for independent variables that may influence the impact of the expansion on IMR. The analysis is based on the inclusion of three independent variables: years passed until implementation (TPASS), state median income (MEDINC), state poverty rate (POVRATE). The resulting regression coefficients from TPASS, MEDINC, and POVRATE were 0.05, -0.15 and 21.64 respectively. The three models in table 3 emphasize the fact that the timing of implementation of the expansion (TPASS) has little to effect of the IMR. This is the same result for the influence of a state's median income on IMR. The notable influence in IMR is for a state's poverty rate. When ran in model 3 of table 3, POVRATE calculated a coefficient of 21.64. This significant of a coefficient is an indicator that this is a far more influential variable upon IMR. Poverty rate having an influence on IMR is not an unexpected occurrence. The Medicaid expansion was implemented to benefit economically disadvantaged individuals. The three models from the multivariate regression have increasingly larger  $R^2$  value. The  $R^2$  value reached 0.35 on model 3, denoting that 35 percent of all variable influence has been explained. This value gives confidence in reliable modelling through this regression.

The IMR for White Non-Hispanic and Black Non-Hispanic are noticeably different in the difference-in-difference model. Taking the results from the difference-in-difference model it is clear that the Black Non-Hispanic category has a consistently higher IMR with non-expansion states increasing its IMR. When compared to White Non-Hispanic, both expansion and non-expansion states both saw some amount of decrease in IMR. The multivariate model presented

---

<sup>18</sup> The lower positive value for non-expansion states indicates a more gradually decrease in IMR.

knowledge that poverty rate has a significant influence on IMR. From prior literature, research has indicated that a majority of the African-American population lives within Southern states as well as racial/ethnic minorities being more likely to live in low-income families.<sup>19 20</sup> In 2021, out of the thirteen states yet to implement the Medicaid expansion eight can be considered as a southern state. With these southern states being a majority of states yet to implement the expansion, a majority of the Black Non-Hispanic population is being excluded from the expansion that would directly benefit them. While trends show a gradual decline in IMR overall in the United States has continued even to include non-expansion states, the analysis demonstrates that White Non-Hispanic individuals are benefiting in both expansion and non-expansion states. These benefits to IMR are reduced for Black Non-Hispanic individuals in expansion states while in non-expansion states the group even sees a negative impact.

## **Conclusion**

This study sought to analyze the impact of the Affordable Care Act's 2014 Medicaid expansion on racial disparities in infant mortality. As the expansion was implemented effects became apparent after the fact. The most notable would be the changes to enrollment. The relation that the Medicaid expansion has had on enrollments for the program is a simple and easily explainable situation. The program expanded eligibility for Medicaid's benefits and thus allowed millions to enroll. The priority of the expansion was to target individuals at an economic

---

<sup>19</sup> Andrews, Christina. 2014. "Unintended Consequences: Medicaid Expansion and Racial Inequality in Access to Health Insurance." *Health & Social Work* 39 (3): 131–32. doi:10.1093/hsw/hlu024.

<sup>20</sup> Garfield, Rachel and Damico, Anthony. 2017. "The Coverage Gap: Uninsured Poor Adults in States that Do Not Expand Medicaid." Kaiser Family Foundation: 2.

disadvantage. More complex effects that the Medicaid expansion brought about can include health outcomes. Many health outcomes are not a result of a singular cause. An interconnected web of various factors can cause health outcomes to improve or deteriorate. Infant mortality rate is one such causal relationship. When the expansion was implemented, years would need to pass until any explainable trend could be found as a result of the influence of Medicaid.

This research examined any racial disparities that occurred as a result of the casual relationship between the Medicaid expansion and its impact on IMR. From the analysis, there is a gradual and continued decline in IMR that varies depending on the state. The impact that the expansion has on IMR is immediate and significant for states that have implemented the measure into their state Medicaid program. The racial disparity between White Non-Hispanic and Black Non-Hispanic are explained through the difference-in-difference and multivariate regression analysis. Disparities in IMR are attributed predominately as a result of location. The impact of a state not implementing the Medicaid expansion is impactful on their state IMR. The states yet to implement the Medicaid expansion has been from majority southern states. From prior literature determining that a majority of African-American population lives in southern states, the influence of non-implementation of the Medicaid expansion on Black Non-Hispanic IMR is significant.

This research was conducted to broadly examine the racial disparities on IMR from the influence of the expansion. The implications of the disparities found in this study highlight the inequities that are currently being faced. Having access to health care is correlated with a decrease in IMR. The exclusion of particular groups can cause wide-spread health inequities as shown by the research conducted in this project. There were some limits to this study that should be considered. the most notable limitation of the analysis was the lack of opportunity to analyze



the effect of specific variables on overall IMR health impact. This is especially for the case of poverty rate. Another limitation can be the analysis on the effect of time after implementation of the expansion. While this study examined the influence of time on IMR, the amount of time that has passed is still under ten years as of conducting this research. Any long-term trends that can appear would take several more year of influence to determine any possible relationship. Given the limits of this study, future studies could pursue connections provided from the analysis in this work. One possible avenue of future research can be the specific relationship that poverty has on IMR since the implementation of the Medicaid expansion in 2014.

## References

- Andrews, Christina. 2014. "Unintended Consequences: Medicaid Expansion and Racial Inequality in Access to Health Insurance." *Health & Social Work* 39 (3): 131–33.  
doi:10.1093/hsw/hlu024.
- Bhatt, Chintan B, and Consuelo M Beck-Sagué. 2018. "Medicaid Expansion and Infant Mortality in the United States." *American journal of public health* 108(4): 565-567.  
doi:10.2105/AJPH.2017.304218
- Courtemanche, Charles, James Marton, Benjamin Ukert, Aaron Yelowitz, Daniela Zapata, and Ishtiaque Fazlul. 2019. "The Three-Year Impact of the Affordable Care Act on Disparities in Insurance Coverage." *Health Services Research* 54 Suppl 1 (February): 307–16. doi:10.1111/1475-6773.13077.
- Flores, René D., and Robert Vargas. 2017. "Medicaid Expansion and Ethnoracial Disparities in Health Insurance Coverage." *Journal of Ethnic & Migration Studies* 43 (12): 2055–71.  
doi:10.1080/1369183X.2017.1323451.
- Garfield, Rachel and Damico, Anthony. 2017. "The Coverage Gap: Uninsured Poor Adults in States that Do Not Expand Medicaid." Kaiser Family Foundation: 1-11.

Han X, Nguyen BT, Drope J, Jemal A. 2015. “Health-Related Outcomes among the Poor: Medicaid Expansion vs. Non-Expansion States.” PLoS ONE 10(12): e0144429.  
<https://doi.org/10.1371/journal.pone.0144429>

Kino, Shiho, and Ichiro Kawachi. 2018. “The Impact of ACA Medicaid Expansion on Socioeconomic Inequality in Health Care Services Utilization.” PLoS ONE 13 (12): 1–13. doi:10.1371/journal.pone.0209935.

Renna, Francesco, Kosteas, Vasilios D. and Dinkar, Kuchibhotla. 2020. “Inequality in health insurance coverage before and after the Affordable Care Act.” Health Economics 30 (2):384–402. doi:10.1002/hec.4195.

Semprini, Jason and Olopade, Olufunmilayo. 2020. “Evaluating the Effect of Medicaid Expansion on Black/White Breast Cancer Mortality Disparities: A Difference-in-Difference Analysis.” American Society of Clinical Oncology 6:1178-1183.  
doi:10.1200/GO.20.00068.

Wadhera RK, Bhatt DL, Wang TY, et al. Association of State Medicaid Expansion With Quality of Care and Outcomes for Low-Income Patients Hospitalized With Acute Myocardial Infarction. JAMA Cardiol. 2019;4(2):120–127. doi:10.1001/jamacardio.2018.4577

U.S. Census Bureau; American Community Survey, 2019 American Community Survey 1-Year Estimates; generated by Julian Garcia; using data.census.gov; <<https://data.census.gov/cedsci/>>; (8 August 2021).

Wiggins, Alexandra, Ibraheem M. Karaye, and Jennifer A. Horney. 2020. “Medicaid Expansion and Infant Mortality, Revisited: A Difference-in-Differences Analysis.” *Health Services Research* 55 (3): 393–98. doi:10.1111/1475-6773.13286.

Yue, Dahai, Petra W. Rasmussen, and Ninez A. Ponce. 2018. “Racial/Ethnic Differential Effects of Medicaid Expansion on Health Care Access.” *Health Services Research* 53 (5): 3640–56. doi:10.1111/1475-6773.12834.

## **Curriculum Vita**

My academic beginning started at the University of Illinois at Chicago with a B.A. in Political Science. During this period, I obtained critical thinking skills covering a variety of political, social and economic issues. This led me towards pursuing an M.S. in Data Analytics and Policy with Johns Hopkins University. The academic expertise provided during this period extends towards several areas. Those skills include data analysis, programming and modelling. The implementation of these skills into this study has allowed for an effective analysis of the chosen topic.